Muhammad Mubeen

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Education

Queen's University – Smith Engineering Kingston, ON, Canada

Bachelor of Applied Science (B.A.Sc) – Mechatronics and Robotics Engineering *May 2028*

- Relevant Courses: Data Structures and Algorithms, Electronics 1, Signals and Systems, Digital Systems, Computer Architecture.

Experiences

Queen's University, Astrophysics Department, BVEX Project Kingston, ON

Summer Research Student, under Dr. Laura Fissel *May 2026 to Aug. 2026*

- Designed, assembled, and hand-soldered (SMD and through-hole) custom **PCBs** in **KiCad** for BVEX, a balloon-borne radio telescope using Very Long Baseline Interferometry (VLBI), fabricating custom DB9 harnesses for sensor and power interconnects.
- Used an **oscilloscope** to diagnose a noisy DC-DC converter connection (±5–10mV deviation) and a multimeter to trace current-sensing line shorts, driving design fixes for the flight payload.
- Integrated and calibrated triple-axis accelerometers and gyroscopes for position tracking over **I2C/SPI** on a Raspberry Pi 5, resolving communication issues and writing Python scripts to validate sensor data.
- Built and tested power measurement systems (**INA241** high-side/low-side sensing) using a **LabJack T7** and **RB12** relay board, enabling full sensor telemetry ahead of the next balloon flight.

SparQ Studios – Queen's University Makerspace Kingston, ON

Media & Software Coordinator *Sept. 2025 – Present*

- Trained **15+ staff and members** on **Bambu Lab and Prusa 3D printers**, slicer software, and soldering techniques, improving equipment proficiency across the makerspace.
- Grew SparQ Studios' **Instagram** account by **150 followers within 15 days** through targeted educational 3D printing and hardware content.
- Designed, deployed, and maintain a full-stack **QR check-in system** (**Flask**, **SQLite**) that fully replaced paper sign-in, giving supervisors reliable digital tracking of attendance and per-member filament usage.

Projects

APSC 101 – Water Filtration System | *Team Lead* Sept. 2024 – Nov. 2024

- Led a **five-person team** to design and prototype an automated water filtration system for a fictional remote Nunavut community.
- Designed an alum dispensing subsystem in **SolidWorks** and programmed control logic in **C++** for pumps, water-level sensors, motors, and an emergency stop, enabling closed-loop control.
- Documented experimental procedures, collected and analyzed data, and validated that the system successfully filtered water as designed, with emphasis on clarity, reproducibility, and iterative testing.

Voron 0.2 CoreXY 3D Printer Build | *Personal Project* May 2025 – June 2025

- Built a **Voron 0.2 CoreXY 3D printer** from commercially available parts, verifying dimensional accuracy with a **30mm calibration cube** and clean overhangs via bridging tests.
- Configured Linux based **Klipper** firmware on a **Raspberry Pi 4** clone for remote control, **PID tuning**, and sensorless homing.
- Validated print quality and speed with a **22-minute Benchy print**, demonstrating the printer's ability to produce accurate, high-quality parts quickly.

Additional Information

Technical Skills: SolidWorks, Fusion 360, KiCad, Klipper, Linux, Docker, Arduino, C/C++, Python, Flask, SQL, Julia, HTML, CSS, MS Office Suite
Hardware: Raspberry Pi Zero W/4B/5, Arduino Uno/Mega, PCB design & soldering (SMD & through-hole), ADXL355 / ICM-20380HT / ADXRS453Z IMUs, sensors, motors
Languages: English (Fluent), Urdu (Fluent)
Activities: PC building, video editing (DaVinci Resolve), public speaking, graphic design, event promotion.
Initiatives: Currently establishing Queen's first Diabetes Link Chapter.